

CLAIMS

1. A method for reducing errors in a piece wise linear analog to digital converter, said piece wise analog to digital converter operating between a minimum voltage and a maximum voltage, said piece wise analog to digital converter using one or more comparators to generate one or more digital bits, each of said digital bits representative of a conversion voltage, said conversion voltage less than said maximum voltage,
5 said method comprising the steps of:

allocating a first voltage interval for linear analog to digital conversion, said first voltage interval extending from said minimum voltage to an intermediate voltage, said intermediate voltage less than said maximum voltage;

10 allocating a second voltage interval for linear analog to digital conversion, said second voltage interval extending from said intermediate voltage to said maximum voltage;

encoding an error correcting band between said first voltage interval and said second voltage interval.

2. A method as described in claim 1 wherein each of said one or more comparators has a sensing level, said error correcting band centered with respect to one of said sensing level, said sensing level at said intermediate voltage.

3. A method as described in claim 2 wherein said error correcting band extends over a correcting voltage, said correcting voltage a fraction of said conversion voltage.

4. A method as described in claim 3 wherein 12 digital bits are used within said piece wise analog to digital converter.

5. A method as described in claim 4 wherein said error correcting band is $1/2048$ of the difference between said minimum voltage and said intermediate voltage.

6. An encoding method for reducing analog to digital conversion errors in a

transmitter said transmitter using a piece wise linear to digital conversion to convert an analog signal to a digital signal representative of said analog signal, and a receiver to reconstruct said analog voltage from said digital signal back to said analog format, said analog signal having a minimum voltage and a maximum voltage, said transmitter using one or more comparators to generate said digital signal, said digital signal having one or more digital bits representative of said analog signal , comprising the steps of :

allocating two or more voltage intervals for linear analog to digital conversion within said transmitter, each of said voltage intervals concatenated to cover said minimum voltage to said maximum voltage;

encoding an error correcting band between each of said two or more voltage intervals to obtain a digital signal;

transmitting said digital signal to said receiver;

detecting digital signatures, said digital signatures corresponding to said error correcting bands included within said digital signal;

subtracting said digital signature from said digital signal to obtain a corrected digital signal;

decoding said corrected digital signal to reconstruct said analog signal.

7. A method as described in claim 6 wherein each of said one or more comparators has a sensing level, said error correcting band centered with respect to one of said sensing level.

8. A method as described in claim 7 wherein said error correcting band extends over a correcting voltage, said correcting voltage a fraction of said minimum to said maximum voltage.

9. A method as described in claim 8 wherein 12 digital bits are used within said transmitter to convert said analog signal to said digital signal.

10. A method as described in claim 9 wherein said error correcting band is

1/2048 of the difference between said minimum voltage and said maximum voltage.

11. A piece wise linear analog to digital converter having reduced errors, said piece wise analog to digital converter operating between a minimum voltage and a maximum voltage, said piece wise analog to digital converter using one or more comparators to generate one or more digital bits, each of said digital bits representative
5 of a conversion voltage, said conversion voltage less than said maximum voltage, said converter comprising:

a first voltage interval for linear analog to digital conversion, said first voltage interval extending from said minimum voltage to an intermediate voltage, said intermediate voltage less than said maximum voltage;

10 a second voltage interval for linear analog to digital conversion, said second voltage interval extending from said intermediate voltage to said maximum voltage;

an error correcting band between said first voltage interval and said second voltage interval.

12. A digital converter as described in claim 11 wherein each of said one or more comparators has a sensing level, said error correcting band centered with respect to one of said sensing level, said sensing level at said intermediate voltage.

13. A digital converter as described in claim 12 wherein said error correcting band extends over a correcting voltage, said correcting voltage a fraction of said conversion voltage.

14. A digital converter as described in claim 13 wherein 12 digital bits are used within said piece wise analog to digital converter.

15. A digital converter as described in claim 14 wherein said error correcting band is 1/2048 of the difference between said minimum voltage and said intermediate voltage.

16. A digital transmission link having a transmitter using a piece wise linear

to digital conversion to convert an analog signal to a digital signal representative of said analog signal, and a receiver to reconstruct said analog voltage from said digital signal back to said analog format, said analog signal having a minimum voltage and
5 a maximum voltage, said transmitter using one or more comparators to generate said digital signal, said digital signal having one or more digital bits representative of said analog signal, said digital transmission link comprising:

a transmitter having two or more voltage intervals for linear analog to digital conversion, each of said voltage intervals concatenated to cover said minimum voltage
10 to said maximum voltage;

one or more error correcting bands between each of said two or more voltage intervals to obtain a digital signal;

transmission means for said digital signal to said receiver;

a receiver having a detector for a digital signature, said digital signature corre-
15 sponding to said error correcting bands included within said digital signal;

means for subtracting said digital signature from said digital signal to obtain a corrected digital signal;

means for converting said corrected digital signal to said analog signal.

17. A link as described in claim 16 wherein each of said one or more comparators has a sensing level, said one or more error correcting band centered with respect to one of said sensing level.

18. A link as described in claim 17 wherein each of said one or more error correcting bands extends over a correcting voltage, said correcting voltage a fraction of said minimum to said maximum voltage.

19. A link as described in claim 18 wherein 12 digital bits are used within said transmitter to convert said analog signal to said digital signal.

20. A method as described in claim 19 wherein said error correcting band is $1/2048$ of the difference between said minimum voltage and said maximum voltage.